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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/494,877	01/31/2000	Zhigang Fang	34098/GTL/S61	4072

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SMITH INTERNATIONAL PATENT APPLICATIONS
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EXAMINER

MCNELIS, KATHLEEN A

ART UNIT	PAPER NUMBER
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1742

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/02/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

09/494,877

Applicant(s)

FANG ET AL.

Examiner

Kathleen A. McNelis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 January 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 7, 11-21, 25-27, 29, 32-34, 37 and 41-44 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7, 11-21, 25-27, 29, 32-34, 37 and 41-44 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Claims Status

Claims 1-5, 7, 11-21, 25-27, 29, 32-34, 37 and 41-44 remain for examination.

Status of Previous Rejections

The following rejections are maintained:

- Claims 1, 2, 4, 7, 14, 15, 17, 19, 20, 25-27, 32, 33, 37, and 41-43 under 35 U.S.C. 102(a) or 102 (e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Fang et al. (U.S. Pat. No. 5,880,382) in view of AMETEK Sealvar® Tech Brief (AMETEK),
- Claims 11-13, 21, 34 and 44 under 35 U.S.C. 103(a) as obvious over Fang et al. (U.S. Pat. No. 5,880,382) in view of AMETEK Sealvar® Tech Brief (AMETEK) as applied to claims 1, 33 and 43,
- Claims 5 and 18 under 35 U.S.C. 103(a) as obvious over Fang et al. (U.S. Pat. No. 5,880,382) in view of AMETEK Sealvar® Tech Brief (AMETEK) as applied to claims 1 and 14 and further in view of Heinrich et al. (U.S. Pat. No. 6,024,776),
- Claims 1-4, 7, 11, 12, 14-17, 19-21, 43 and 44 under 35 U.S.C. 103(a) as being unpatentable over Great Brittan patent 1 450 654 (GB '654) in view of European Patent 0 085 125 (EP '125),
- Claims 13, 33, 34, 37, 41 and 42 under 35 U.S.C. 103(a) as being unpatentable over Great Brittan patent 1 450 654 (GB '654) in view of European Patent 0 085 125 (EP '125) as applied to claim 1, and further in view of Great Brittan patent 2 273 301 (GB '301) or Liang et al. (U.S. Pat. No. 6,197,084) or Fang et al. (U.S. Pat. No. 5,880,382),
- Claims 25-27 and 29 under 35 U.S.C. 103(a) as being unpatentable over Great Brittan patent 1 450 654 (GB '654) in view of European Patent 0 085 125 (EP '125) and Fang et al. (U.S. Pat. No. 5,880,382), and
- Claims 5 and 18 under 35 U.S.C. 103(a) as obvious over Great Brittan patent 1 450 654 (GB '654) in view of European Patent 0 085 125 (EP '125) as applied to claims 1 and 14 and further in view of Heinrich et al. (U.S. Pat. No. 6,024,776).

DETAILED ACTION

Claim Rejections - 35 USC § 102

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 2, 4, 7, 14, 15, 17, 19, 20, 25-27, 32, 33, 37, and 41-43 are rejected under 35 U.S.C. 102(a) or 102 (e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Fang et al. (U.S. Pat. No. 5,880,382) in view of AMETEK Sealvar® Tech Brief (AMETEK).

Fang et al. in view of AMETEK Sealvar® Tech Brief (AMETEK) is applied as set forth in the 10/24/2006 Office action.

Claims 11-13, 21, 34 and 44 are rejected under 35 U.S.C. 103(a) as obvious over Fang et al. (U.S. Pat. No. 5,880,382) in view of AMETEK Sealvar® Tech Brief (AMETEK) as applied to claims 1, 33 and 43.

Fang et al. in view of AMETEK Sealvar® Tech Brief (AMETEK) is applied as set forth in the 10/24/2006 Office action.

Claims 5 and 18 are rejected under 35 U.S.C. 103(a) as obvious over Fang et al. (U.S. Pat. No. 5,880,382) in view of AMETEK Sealvar® Tech Brief (AMETEK) as applied to claims 1 and 14 and further in view of Heinrich et al. (U.S. Pat. No. 6,024,776).

Fang et al. in view of AMETEK Sealvar® Tech Brief (AMETEK) and Heinrich et al. is applied as set forth in the 10/24/2006 Office action.

Claims 1-4, 7, 11, 12, 14-17, 19-21, 43 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Great Brittan patent 1 450 654 (GB '654) in view of European Patent 0 085 125 (EP '125).

GB '654 in view of EP '125 is applied as set forth in the 10/24/2006 Office action.

Claims 13, 33, 34, 37, 41 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Great Brittan patent 1 450 654 (GB '654) in view of European Patent 0 085 125 (EP '125) as applied to claim 1, and further in view of Great Brittan patent 2 273 301 (GB '301) or Liang et al. (U.S. Pat. No. 6,197,084) or Fang et al. (U.S. Pat. No. 5,880,382).

GB '654 in view of EP '125 and GB '301 or Liang et al. or Fang et al. is applied as set forth in the 10/24/2006 Office action.

Claims 25-27 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Great Brittan patent 1 450 654 (GB '654) in view of European Patent 0 085 125 (EP '125) and Fang et al. (U.S. Pat. No. 5,880,382).

GB '654 in view of EP '125 and Fang et al. is applied as set forth in the 10/24/2006 Office action.

Claims 5 and 18 are rejected under 35 U.S.C. 103(a) as obvious over Great Brittan patent 1 450 654 (GB '654) in view of European Patent 0 085 125 (EP '125) as applied to claims 1 and 14 and further in view of Heinrich et al. (U.S. Pat. No. 6,024,776).

GB '654 in view of EP '125 and Heinrich et al. is applied as set forth in the 10/24/2006 Office action.

Response to Arguments

Applicant's arguments filed 01/24/2007 have been fully considered but they are not persuasive.

Arguments are summarized as follows:

1. The instant invention is a two-phase material whereas Fang disclose a three-phase arrangement.
2. The use of a low CTE alloy in Fang is directed to improving thermal expansion compatibility between particles and the continuous matrix surrounding the same, whereas in the instant invention the low CTE binder bonds the hard phase grains themselves. The instant invention is therefore structurally different than Fang.
3. While Fang discloses that the second phase binder used to surround the particles has low CTE, Fang does not suggest this of the binder used to form the particles themselves.
4. Fang does not disclose that the first phase binder has the specific CTE as claimed.
5. The Ametek tech brief fails to disclose or suggest any thermal expansion of this material or use of this material to form a cermet material.
6. Claim 25 requires a three-phase material comprising a low CTE second phase binder alloy, which is not disclosed by Fang et al.
7. Fang et al. does not disclose the microstructure recited in claim 43.
8. Regarding the rejection under '654 in view of '125, '654 fails to disclose or suggest the use of Mn, which is required by the instant invention. Examiner relies upon the '125 patent for use of Mn in forming the alloy. Applicant does not agree that there is sufficient motive to combine the teaching, since the '125 patent expressly notes that the purpose is for replacement of conventional WC-Co materials. One of ordinary skill in the art familiar with the '125 patent would not be motivated to pick and chose from the different elements (Ni, Mn, C and Fe) to combine with a binder including Co, which

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would be counter to the teaching of the '125 patent, which in fact teaches away from Co.

9. Neither '654 nor '125 discloses the microstructure required by claim 43.
10. The '301 patent, Liang and Fang fail to cure the shortcomings of '654 and '125.
11. Regarding the rejection of claims 25-27 and 29 under GB '654 in view of EP '125 and Fang et al., none of these references teach the 3 phase composition recited in claim 25.
12. Regarding the rejection of claims 5-18 under '654 in view of '125 and Heinrich, Heinrich discloses an alloy with at least 40 wt% Co, thus does not teach an alloy as recited in independent claims 1 and 14 comprising 10 to 30 % Co.

Examiner's responses are as follows:

1. Instant claims 1-5, 7, 11-21, 33, 34, 37, 41-44 disclose two phases, but do not preclude a third phase (i.e. use of "comprising" in the preamble). Instant claims 25-27, 29, 32 disclose 3 phases. The transitional term "comprising", which is synonymous with "including," "containing," or "characterized by," is inclusive or open-ended and does not exclude additional, unrecited elements or method steps. (See M.P.E.P. 2111.03). Therefore 3 phases are either allowed by or required by the instant claims.
2. Claims 1, 14, 25, 33 and 43 recites "comprising" regarding the cermet material, therefore elements and phases other than those recited may be present. Regarding claims 1, 14, 33 and 43, Fang et al. '382 discloses the first phase grains and second phase binder as discussed on page 4 of the 10/24/2006 Office action and therefore meets the limitations of these claims. The additional phase discussed in the arguments is not precluded by the instant claims, even though it is in contact with the first phase grains as argued and as disclosed in Fang et al. '382. Claim 25 requires 3 phases.
3. Fang et al. '382 discloses the particles and low CTE binder phase as claimed. Although Fang et al does not suggest that the low CTE binder phase forms the particles themselves, such is not required by the instant claims.

4. Fang et al. '382 discloses that the second phase binder meets the claimed CTE limitation discussed on p. 4 of the 10/24/2006 Office action. Further, this phase (22) bonds the first phase grains together as shown in Fig. 4. The additional phase (i.e. first phase) is not precluded by the instant claims, even though that additional phase is in contact with the first and second phases because of the phrase "comprising" in regard to the cermet composition.
5. The primary reference, Fang et al. '382 discloses the use of Sealvar® in example 7, as discussed on p. 4 of the 10/24/2006 Office action. It is therefore the primary reference which suggests the use of Sealvar® to form a cermet. The product data for Sealvar® (AMETEK product data) is cited by examiner because it recites the thermal expansion properties for this alloy in the table on the second page, under the heading "Thermal Expansion."
6. Instant claim 25 requires three phases:
 - a. The grains of metal-C, -N, -CN or -B, which is essentially as claimed in previous claims;
 - b. A binder which is a mixture of metals, which is essentially as claimed in previous claims;
 - c. And a third phase which is selected from the group consisting of Co, Ni, Fe, W, Mo, Ti, Ta, V, Nb alloys thereof and alloys with materials selected from the group consisting of B, Cr, and Mn, wherein the first and second phases form particles that are disbursed within the third phase.

As discussed on pp. 5 and 6 of the 10/24/2006 Office action, claim 25 is not limited by the steps taken to construct the 3-phase material. The alloy disclosed by Fang et al. comprises each of the claimed phases, which are combined in such a way that the resultant alloy would be essentially the same or substantially similar. Instant claim 25 does not require that both the binder phase and the third phase have a specific CTE, but

only limits the binder phase CTE. This limitation is met by Fang et al. as discussed above and in the 10/24/2006 Office action.

7. Claim 43 is addressed on p. 7 of the 10/24/2006 Office action, showing repeating arrangement of structural phases. Claim 43 recites "comprising" in the preamble and in line 12 regarding the first and second phases, and as such is not limited to the two structural phases. See responses above regarding the presence of an additional phase.
8. Both GB '654 and EP '125 are drawn to cemented carbides as discussed on pp. 8-9 of the 10/24/2006 Office action, therefore the two references are analogous. The motive to combine is increased wear resistance as discussed on p. 9 of the 10/24/2006 Office action. EP '125 discloses that the presence of manganese in the subject alloys has an especially significant effect on increasing wear resistance (p. 3 lines 32-43), which examiner contends is sufficient motivation for one of ordinary skill in the art to select Mn from the list of Ni, Mn, C and Fe. Further, while EP '125 compares results from the inventive composition with a traditional WC-Co carbide-binder matrix, examiner does not agree that this teaches away from including Mn in a binder that also contains Co.
9. Claim 43 requires a repeating arrangement of structural units, each comprising a first and second phase. GB '654 discloses constructing by milling the first phase and second phase in a ball mill so that the two phases are in contact, which would lead to the repeating arrangement as discussed on p. 10 of the 10/24/2006 Office action.
10. GB '301, Liang et al. and Fang et al. are cited as secondary reference teaching specific limitations recited in instant depending claims 13, 33, 32, 37, 41 and 42 as discussed on pp. 11-12 of the 10/24/2006 Office action.
11. The three-phase composition is taught by Fang et al. as discussed on pp. 13-14 of the 10/24/2006 Office action. See response to argument No. 6 above.

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12. GB '654 in view of EP '125 discloses the alloy composition recited in independent claims 1 and 14. Heinrich discloses the addition of TiC-TiCN (as required in instant depending claims 5 and 18) to a Co-Ni-Fe binder as set forth on p. 15 of the 10/24/2006 Office action. Motive to combine is discussed on p. 15 of the 10/24/2006 Office action. While the binder compositions are not identical, they are similar enough to be analogous, and one of ordinary skill in the art would have reasonable expectation of success in combining the teaching of Heinrich with GB '654 in view of EP '125.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kathleen A. McNelis whose telephone number is 571 272 3554. The examiner can normally be reached on M-F 8:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KAM
03/27/2007



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